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Datasheet for the decision of 14 March 2019

Case Number: T 0217/15 - 3.3.08

Application Number: 05791482.2

Publication Number: 1781802

IPC: C12P21/02, C12N15/62

Language of the proceedings: EN

Title of invention:
PRODUCTION OF A TNFR-IG FUSION PROTEIN

Patent Proprietor:
Pfizer Ireland Pharmaceuticals

Opponent:
Duckett, Anthony Joseph

Headword:
TNFR-Ig production/PFIZER

Relevant legal provisions:
EPC Art. 56, 123(2)
RPBA Art. 13(1)

Keyword:
Main request (claims as granted) - inventive step (no);
Auxiliary request 1 - admitted into the proceedings (yes);
Auxiliary request 1 - added subject-matter (yes);
Auxiliary request 2 - admitted into the proceedings (no);

Decisions cited:
T 2244/09, T 2184/10, T 2570/11

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 0217/15 - 3.3.08

D E C I S I O N
of Technical Board of Appeal 3.3.08
of 14 March 2019

Appellant: (Opponent)	Duckett, Anthony Joseph Mathys & Squire LLP The Shard 32 London Bridge Street London SE1 9SG (GB)
Representative:	Goodfellow, Hugh Robin Michell, Stephen Nikolić, Emily Carpmaels & Ransford LLP One Southampton Row London WC1B 5HA (GB)
Respondent: (Patent Proprietor)	Pfizer Ireland Pharmaceuticals Operations Support Group Ringaskiddy Cork (IE)
Representative:	Ford, Timothy J. Markus, Marc Pfizer European Patent Department 23-25 avenue du Docteur Lannelongue 75668 Paris Cedex 14 (FR)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 27 November 2014 rejecting the opposition filed against European patent No. 1781802 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	B. Stolz
Members:	P. Julià
	D. Rogers

Summary of Facts and Submissions

I. European patent no. 1 781 802 is based on European patent application no. 05 791 482.2, published under the PCT with International application number WO 2006/026447 (hereinafter "the patent application"). The patent was opposed on the grounds set forth in Articles 100(a), 100(b) and 100(c) EPC. The opposition division rejected the opposition and maintained the patent as granted.

II. The patent was granted with fifty claims, claim 1 of which reads as follows:

"1. A method of producing a tumor necrosis factor receptor-immunoglobulin fusion protein (TNFR-Ig) in a large-scale production cell culture comprising the steps of:

providing a cell culture comprising:

mammalian cells that contain a gene encoding TNFR-Ig, which gene is expressed under condition of cell culture; and

a medium containing glutamine and having a medium characteristic selected from the group consisting of: (i) a cumulative amino acid amount per unit volume greater than about 70 mM, (ii) a molar cumulative glutamine to cumulative asparagine ratio of less than about 2, (iii) a molar cumulative glutamine to cumulative total amino acid ratio of less than about 0.2, (iv) a molar cumulative inorganic ion to cumulative total amino acid ratio between about 0.4 to 1, (v) a combined cumulative amount of glutamine and

asparagine per unit volume of greater than about 16 mM, and combinations thereof;

maintaining said culture in an initial growth phase under a first set of culture conditions for a first period of time sufficient to allow said cells to reproduce to a viable cell density within a range of about 20%-80% of the maximal possible viable cell density if said culture were maintained under the first set of culture conditions;
changing at least one of the culture conditions, so that a second set of culture conditions is applied;
maintaining said culture for a second period of time under the second set of conditions and for a second period of time so that TNFR-Ig accumulates in the cell culture."

III. An appeal was lodged by the opponent (appellant). With the statement setting out the grounds of appeal, the appellant submitted new evidence (documents (21) to (25)) and Annex A, wherein objections were raised under Articles 123(2), 83, 54 and 56 EPC against auxiliary requests filed by the patent proprietor (respondent) at first instance.

IV. In reply to the statement of grounds of appeal, the respondent filed a main request (claims as granted), auxiliary requests 1 to 22, and new evidence (document (26)). The respondent requested that the appellant's new evidence not be admitted into the proceedings.

V. The appellant replied thereto and filed further evidence (document (27)).

VI. As an auxiliary measure, both parties requested oral proceedings.

VII. The board summoned the parties to oral proceedings. In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA), the parties were informed of the provisional, non-binding opinion of the board on some of the issues of the case. In particular, the board stated that the main request did not appear to contravene Article 123(2) EPC and appeared to fulfil the requirements of Articles 83 and 54 EPC but not those of Article 56 EPC. Whilst the admission of auxiliary requests 1 to 22 into the appeal proceedings remained an open question, the board was minded not to admit the new evidence (documents (21) to (27)) into these proceedings.

VIII. The parties replied to the board's communication. The respondent filed new auxiliary requests 21 and 22, withdrew its former auxiliary request 21 and renumbered its former auxiliary request 22 as auxiliary request 23. The appellant submitted comments on some of the respondent's auxiliary requests and on their (non) admissibility into the appeal proceedings.

IX. Oral proceedings were held on 14 March 2019. During these proceedings, the respondent made previous auxiliary requests 22 and 15 its new auxiliary requests 1 and 2, respectively.

X. Auxiliary request 1 contains three claims, claim 1 of which reads as follows:

"1. A method of producing a tumor necrosis factor receptor immunoglobulin fusion protein (TNFR-Ig) in a

large-scale production cell culture comprising the steps of:

providing a cell culture comprising:

CHO cells that contain a gene encoding TNFR-Ig, which gene is expressed under condition of cell culture; and

a medium containing glutamine and having medium characteristics: (i) a cumulative amino acid amount per unit volume greater than 70 mM, (ii) a molar cumulative glutamine to cumulative asparagine ratio of less than 2, (iii) a molar cumulative glutamine to cumulative total amino acid ratio of less than 0.2, (iv) a molar cumulative inorganic ion to cumulative total amino acid ratio between 0.4 to 1, and (v) a combined cumulative amount of glutamine and asparagine per unit volume of between 16 mM and 36 mM;

maintaining said culture in an initial growth phase under a first temperature for a first period of time sufficient to allow said cells to reproduce to a viable cell density within a range of 20%-80% of the maximal possible viable cell density if said culture were maintained under the first temperature; changing the culture conditions, so that a second temperature is applied; maintaining said culture for a second period of time under the second temperature and for a second period of time so that TNFR-Ig accumulates in the cell culture; wherein the initial glutamine concentration of said medium is less than or equal to 4 mM and glutamine is only provided in the initial medium at the beginning of the cell culture."

XI. Auxiliary request 2 contains forty seven claims, claim 1 of which reads as follows:

"1. A method of producing a tumor necrosis factor receptor immunoglobulin fusion protein (TNFR-Ig) in a large-scale production cell culture comprising the steps of:

providing a cell culture comprising:

mammalian cells that contain a gene encoding TNFR-Ig, which gene is expressed under condition of cell culture; and

a medium containing glutamine and having medium characteristics: (i) a cumulative amino acid amount per unit volume greater than about 70 mM, (ii) a molar cumulative glutamine to cumulative asparagine ratio of less than about 2, (iii) a molar cumulative glutamine to cumulative total amino acid ratio of less than about 0.2, (iv) a molar cumulative inorganic ion to cumulative total amino acid ratio between about 0.4 to 1, and (v) a combined cumulative amount of glutamine and asparagine per unit volume of greater than about 16 mM;

maintaining said culture in an initial growth phase under a first set of culture conditions for a first period of time sufficient to allow said cells to reproduce to a viable cell density within a range of about 20%-80% of the maximal possible viable cell density if said culture were maintained under the first set of culture conditions; changing at least one of the culture conditions, so that a second set of culture conditions is applied; maintaining said culture for a second period of time under the second set of conditions and for a second period of time so that TNFR-Ig accumulates in the cell culture; wherein

lactate levels are lower than those levels observed under otherwise identical conditions in otherwise identical medium that lacks said medium characteristic; ammonium levels are lower than those levels observed under otherwise identical conditions in otherwise identical medium that lacks said medium characteristic; and total amount of produced TNFR-Ig is at least as high as that observed under otherwise identical conditions in otherwise identical medium that lacks said medium characteristic."

XII. The following documents are cited in this decision:

(1): US 6,656,466 (publication date: 2 December 2003);

(2): US 5,122,469 (publication date: 16 June 1992);

(3): US 2003/0087372 (publication date: 8 May 2003).

XIII. The submissions made by the appellant, insofar as relevant to the present decision, may be summarised as follows:

Main request
Article 100(a) EPC; Article 56 EPC

The closest state of the art could be either document (1) or document (3). Document (1) disclosed a process for producing TNFR-Ig in CHO host cells. Example 1 described culture conditions with a first (growth) and a second (transition) phase, wherein culture parameters were changed from optimal growth to production conditions. A temperature shift of the culture was performed during the transition phase. CHO cells were grown under growth phase conditions for 2 days, attaining thereby the viable cell density cited

in claim 1. Large-scale protein production and several types of bioreactors/operation systems (fed-batch, batch, continuous mode) were mentioned in document (1). As regards the culture medium, document (1) referred to a DMEM/HAM F-12 based formulation with modified concentration of some components, citing document (2) in this context. The differences between document (1) and claim 1 were the medium characteristics (i) to (v).

If the objective technical problem was the provision of an improved method for TNFR-Ig production, the problem was not solved over the whole breadth of claim 1. The medium characteristics and their ranges were broadly defined in claim 1. Whilst claim 1 required only one of these characteristics, the desired (improvement) effect was highly context-dependent and the evidence on file showed that such effect depended on three interlinked variables: the specific medium, the particular cell line, and the production process itself. Culture media were very complex with a large number of components; minor changes in their concentrations had a huge impact on the culture. Cell lines reacted differently to selective culture pressures and the parameters of the process (volume, temperature, feed timing, etc.) were all highly relevant for attaining the desired effect. There was no evidence on file showing that any of the medium characteristics (i) to (v) was exclusively responsible for an improvement; the evidence on file showed that this effect was only attained because of the exact combination of other variables in the culture method. Thus, the objective technical problem was the provision of an alternative method to that disclosed in document (1).

Document (2) disclosed media for culturing CHO cells at high density and to improve the production of

recombinant proteins in general. Table 4 listed the composition (ingredients, concentrations) of the preferred medium, namely the "Super" medium used in all examples. In view of the broad definition of the medium characteristics in claim 1, in particular giving the term "about" the meaning as described in the patent (range of values falling within 25% of the reference value), the "Super" medium satisfied at least three medium characteristics of those cited in claim 1, namely characteristics (i), (iii) and (v). No inventive skill was required to follow the indications given in document (1) and use the preferred medium disclosed in document (2), thereby arriving at the claimed method in an obvious manner.

Document (3) disclosed the expression of recombinant polypeptides in CHO cell cultures. Improved cell culture viability and reduced by-products (ammonium, lactic acid) accumulation resulted in higher production yields of recombinant polypeptides, including tumour necrosis factors and growth factor receptors. Reference was made to the advantages of the culture method for large-scale production. The method comprised a cell growth phase and a production phase; stepwise (batch-fed) and continuous cultures were described as well as the advantages of a low concentration of glutamine, a temperature shift at the beginning of the production phase, and an excess of amino acids in the cell growth phase. Table 1 disclosed the compositions of two basic media. Whilst Medium A met four of the medium characteristics cited in claim 1 (all except characteristic (ii)), Medium B met all of them (account taken of the 25% variation encompassed by the term "about"). The authors of document (1) were well-aware of document (3) (both documents shared the same assignee and one of the inventors) and no inventive

skill was required to use the basic media of document (3) for producing the TNFR-Ig disclosed in document (1), thereby arriving at the claimed method in an obvious manner.

Auxiliary request 1
Admission into the appeal proceedings

This auxiliary request was new in the proceedings, late-filed and did not arise from any unforeseen or unexpected event; it was an amendment of the respondent's case (Article 13(1) RPBA). It could have been filed earlier because it addressed objections that were raised at earlier stages of the proceedings. The respondent had waited for the board's provisional opinion before filing this request and, when filing it, only provided a short reasoning; no explanation was given as to which features of this request provided an inventive contribution over the prior art. The filing of this request was thus not substantiated. Moreover, this request was divergent from previous auxiliary requests 1 to 20 (which were already divergent among themselves) filed at first instance and filed again in reply to the grounds of appeal. It was not fair to expect the appellant to examine such a large number of auxiliary requests and be in a position to argue against each one of them after a selection made by the respondent arising from the course/development of the appeal proceedings. The less so for new requests, such as auxiliary request 1, with amendments comprising subject-matter taken from the description or examples of the patent application, such as the mammalian host cell line and temperature-shift. Moreover, auxiliary request 1 gave rise *prima facie* to new objections and it did not overcome all the objections on file, in particular those under Articles 123(2) and 56 EPC.

Article 123(2) EPC

The subject-matter of auxiliary request 1 was not directly derivable from the patent application; several selections were required for arriving at this subject-matter. A medium containing glutamine and all five medium characteristics cited in claim 1 of auxiliary request 1 was not disclosed in the patent application. Paragraphs [00005] and [00150] of the patent application referred to "one or more" of these medium characteristics; paragraph [00157] referred to "one, some or all of the above characteristics", wherein however the "above characteristics" were not limited to those cited in claim 1 but included others, such as low levels of glucose and glutamine. Moreover, the closed range of combined cumulative amount of glutamine and asparagine of between 16 mM and 36 mM was not defined as a combined cumulative amount in paragraph [00156]; this range was described only in Example 14 of the patent application but together with other very specific medium characteristics. Although claim 82 of the patent application was directed to the claimed method and the culture medium contained five medium characteristics, characteristic (v) did not specify a closed range but "a combined cumulative amount of glutamine and asparagine ... greater than about 16 mM". A combination of the medium characteristics cited in claim 1 of auxiliary request 1 with a temperature shift between a first and a second set of culture conditions required also a selection not directly derivable from the patent application. Claim 7 of the patent application and several paragraphs in the patent application, such as paragraphs [0008] and [00171], referred to four possible parameters (and combinations thereof) for changing culture conditions; temperature

was only one of them. The features in claim 1 of auxiliary request 1 defining an initial glutamine concentration of "less than or equal to 4 mM" and glutamine to be "only provided in the initial medium at the beginning of the cell culture", were not disclosed in paragraphs [00149] to [00158] of the patent application which, under the general heading "Media", described the specific medium characteristics of the preferred media. Claims 11 and 16 of the patent application described each one of these features, but these claims were dependent only on claim 1 of the patent application and thus, their combination was not directly derivable from these claims. The same reasoning applied to claim 15 of the patent application which defined a total cumulative amount of glutamine. CHO host cells were disclosed in paragraph [00144] of the patent application in a non-limiting list of 19 types of specific mammalian cells. Although CHO cells were identified therein as a preferred embodiment, none of the claims of the patent application was limited thereto.

Auxiliary request 2
Admission into the appeal proceedings

Auxiliary request 2 was identical to auxiliary request 15 filed at first instance; its admission into the proceedings had not been examined by the opposition division. When it was filed before the opposition division, no substantiation was provided nor was its filing substantiated in the respondent's reply to the grounds of appeal. The respondent stated only in a general manner that the request addressed the objections raised under Article 56 EPC, but the same short statement was also given for the twenty auxiliary requests submitted. Nothing was on file to explain

which of the features introduced into this request provided an inventive contribution over the prior art. Auxiliary request 2 was not convergent with auxiliary request 1 and the amendments with functional features introduced into this request differed from those introduced into auxiliary request 1, resulting in new objections (lack of sufficiency of disclosure and inventive step, added subject-matter), in particular when account was taken of all new combinations arising from the dependent claims reintroduced in auxiliary request 2.

XIV. The submissions made by the respondent, insofar as relevant to the present decision, may be summarised as follows:

Main request
Article 100(a) EPC; Article 56 EPC

According to the established case law, the closest state of the art was directed to the same purpose as the invention. Whilst the methods of document (1) and of claim 1 were both directed to the production of a TNFR-Ig fusion protein, document (3) was concerned with the production of other polypeptides. Document (1) represented thus the closest state of the art. The disclosure of document (1) differed from that of the patent; document (1) did not identify any specific culture medium, in particular not the specific medium characteristic (i) to (iv), nor a shift in the culture conditions when 20% to 80% of the viable cell density was reached. This requirement was not disclosed by the reference in document (1) to a 2 day growth phase.

The objective technical problem was the provision of an improved method for the production of TNFR-Ig fusion

protein. The claimed method solved this problem and, indeed, over the whole breadth of the claims. The information and data provided by the patent allowed a skilled person to overcome occasional failures without undue burden or inventive skill; only a few attempts were required to transform failure into success. The overwhelming data in the patent outweighed any possible doubt and showed that the desired effect (improvement) was achieved over the whole breadth of the claim. Apart from generic and unsupported assertions, there was no evidence on file showing that the information and data provided by the patent as well as the conclusions derived therefrom were inappropriate or plainly wrong. It was thus plausible that an improved production of TNFR-Ig fusion protein was attained across the whole breadth of claim 1. The same standard should be applied for Articles 56 and 83 EPC; there were no serious doubts, let alone supported by facts, that the problem was not solved over the whole breadth of the claims.

Although document (1) referred to a culture medium disclosed in document (2), this medium was mentioned only as a possible example of a culture medium and there was no indication of any of the specific culture media disclosed in document (2). On the contrary, reference was made in document (1) to the presence of (undefined) modifications in the composition and concentration of some components of the culture medium disclosed in document (2). Thus, the references in document (1) did not lead a skilled person to the "Super" medium disclosed in document (2) in a direct manner. Moreover, there was no suggestion in either document (1) or document (2) as regards the importance of any of the medium characteristics (i) to (v) mentioned in claim 1. The selection of the "Super" medium disclosed in document (2) was not obvious from

document (1), nor was it obvious for a skilled person to select any of the medium characteristics (i) to (v) cited in claim 1 from the disclosures of any of these documents, either alone or in combination.

Likewise, there was no pointer in document (1) that could lead a skilled person to document (3); hindsight knowledge of the patent was required to combine these two documents. Document (3) followed a different strategy than that of the patent since it was focused on media having high glucose concentrations and osmolarity; a high glucose concentration and the inclusion of glutamate allowed for a reduced amount of glutamine in the media. Document (3) did not refer to the medium characteristics mentioned in claim 1 nor to the importance of the asparagine content and the total amino acid content, let alone to their optimization in relation to the amount of glutamine in order to attain an improved expression of a recombinant polypeptide. On the contrary, several references in document (3) pointed away from considering the glutamine content to have a strong effect or significant role. Document (3) described an alternative route - different from that disclosed in the patent - for improving the culture media and it did not suggest that a medium having the characteristics (i) to (v) could be important for optimising the production of a recombinant polypeptide.

Auxiliary request 1

Admission into the appeal proceedings

According to the established case law, new requests could be admitted at a late stage of appeal proceedings if the amendments were justified, such as when they were filed in response to objections that were not in the decision under appeal but were raised in writing

during the appeal proceedings. In the present case, the opposition division rejected the opposition and maintained the patent as granted. Auxiliary request 1 was filed in reply to the objections/comments made by the board in its communication, it was the first opportunity for the respondent to reply thereto; the request was filed at the earliest possible stage of the proceedings. The amendments introduced into auxiliary request 1 were present in previous auxiliary requests filed at first instance. The deletion of all dependent claims, the limitation to CHO cells and the introduction of features related to the (initial) glutamine concentration were made in direct reply to the board's objections/comments. None of these amendments could have surprised the appellant and they did not create any new case. Auxiliary request 1 was convergent with previous auxiliary requests filed at first instance. Indeed, the problem-solution approach formulated for the main request and the relevant prior art cited therein, was relevant for, and applied to, auxiliary request 1. This auxiliary request overcame all objections raised in the proceedings and *prima facie* fulfilled all the requirements of the EPC, in particular those of Articles 123(2),(3) and 84 EPC and thus, it was formally allowable.

Article 123(2) EPC

Media formulations having "one or more" or "one, some or all" of the medium characteristics (i) to (v) cited in claim 1 of auxiliary request 1 were disclosed in paragraphs [0005] and [00157] of the patent application; all these characteristics were explicitly cited in paragraph [00150]. In line therewith, claim 82 of the patent application defined a medium containing all five medium characteristics (i) to (v). In claim 1

of auxiliary request 1, the medium characteristic (v) was amended so as to replace the upper ended-range "greater than about 16 mM" with the closed range "between 16 mM and 36 mM". Basis for this amendment was found in paragraph [00156] and in Example 14 of the patent application.

The amendment related to the temperature shift between a first and second culture conditions had a basis in the last sentence of page 2 and in paragraph [00171] of the patent application. Paragraphs [00172] to [00175] were concerned with a temperature shift and claim 7 of the patent application referred also to a temperature shift. CHO cells were identified as preferred mammalian host cells in paragraph [00144] and, indeed, all the examples of the patent application were performed using CHO host cells.

Claims 11 and 16 of the patent application provided a basis for the amendment related to the initial glutamine concentration of the cell culture medium (see also claim 15). The features related to the glutamine concentration introduced into claim 1 of auxiliary request 1 were also described in several of the Examples disclosed in the patent application. In view of the context of these disclosures and the specific claims 11 and 16 (see also claim 15), the amendment introduced into claim 1 of auxiliary request 1 had a basis in the patent application.

The amendments introduced into claim 1 of auxiliary request 1 did not result in any new intermediate generalisation. All features introduced into this claim were acknowledged in the patent application to be highly interdependent, claim 1 only gathered all of them together in an explicit manner.

Auxiliary request 2
Admission into the appeal proceedings

Auxiliary request 2 was filed as auxiliary request 15 at first instance and filed again in reply to the grounds of appeal; the earliest possible stage in appeal proceedings. It was not a late-filed request. The appellant had been aware of this auxiliary request for years and thus, it could not have been taken by surprise since it had plenty of time to examine the request. Auxiliary request 2 did not change the legal and factual scope of the proceedings from that of the opposition procedure. The amendments introduced into this request took into account the objections raised by the board under Articles 56 and 123(2) EPC against the main request and auxiliary request 1, respectively. The combinations of features present in auxiliary request 2, including combinations resulting from the dependent claims, were all directly and unambiguously derivable from the patent application as a whole. The functional features introduced into auxiliary request 2 addressed the board's objection that the technical problem was not solved over the whole breadth of the claims. All these amendments were made in direct reply to the board's objections and to the decision taken upon the main request and auxiliary request 1.

XV. The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

XVI. The respondent (patent proprietor) requested that the appeal be dismissed or, in the alternative, that the patent be maintained upon the basis of one of auxiliary

requests 1 or 2, both filed at the oral proceedings before the board on 14 March 2019.

Reasons for the Decision

Main request (claims as granted)
Article 100(a) EPC; Article 56 EPC

The closest state of the art

1. Both documents, (1) and (3), were identified as possible alternative closest prior art in the opposition proceedings and in the statement of grounds of appeal. With reference to the "Guidelines for Examination in the European Patent Office" (Part G, Chapter VII, 5.1), the opposition division selected document (1) as closest prior art when assessing the issue of inventive step (cf. page 18, point 64 of the decision under appeal). In the communication pursuant to Article 15(1) RPBA, the board referred to these two documents and, after analyzing their disclosures, gave a provisional opinion on this issue (cf. page 13 to 18, points 30 to 33 of the board's communication). At oral proceedings before the board, the respondent referred to the established case law for selecting document (1) as the closest prior art (cf. "Case Law of the Boards of Appeal of the EPO", 8th edition 2016, I.D.3, 163).

2. Although the established case law recognises that, according to the circumstances, more than just one prior art document can qualify as closest prior art (cf. *inter alia*, T 2570/11 of 12 July 2017, point 8 of the Reasons), the board, in view of the outcome of its decision on inventive step based on document (1) as closest state of the art, sees no need to further pursue this issue and takes document (1), which all

parties have identified as an appropriate prior art document, for the formulation of the problem and solution approach.

3. Document (1) discloses a method of producing a TNFR-Ig fusion protein in a mammalian cell culture (cf. column 1, lines 12 to 17; column 17, lines 1 to 7), wherein CHO cells are identified as preferred host cells (cf. column 10, lines 24 and 25; column 18, lines 45 to 58). According to this document, "certain mammalian cell culture process parameters affect cell specific productivity" (cf. column 3, lines 9 to 11). Under the heading "Cell Culture Procedures" in column 8, "factors which increase cell specific productivity during the production of a glycoprotein produced by mammalian cell culture" are identified, in particular it is stated that "[f]actors which affect cell specific productivity are well known in the art and include, but are not limited to ... media nutrients and other supplements, ... the temperature and pH of the cell culture, and the like". Moreover, "adjustment of these factors, alone or in combination, ... increase cell specific productivity" (cf. column 8, line 46 to column 9, line 12). Whilst the temperature and osmolality of the medium are identified as important factors (cf. *inter alia*, column 3, lines 36 to 38 and lines 45 to 50), it is also acknowledged that "[c]ontrolling the glucose concentration serves to provide adequate carbon source to the cells and simultaneously control the production of lactic acid by the host cells. This is advantageous in that it limits the pH decrease in the culture medium ..." (cf. column 14, lines 13 to 19).

4. The cell culture process described in document (1) may comprise a single or several phases. In this latter

case, the cell culture process comprises "a growth phase for a period of time and under such conditions that cell growth is maximized", wherein this phase may be "followed by a transition phase in which cell parameters ... are selected and engaged". These phases are "followed by a production phase of the cell culture wherein parameters selected in the transition phase are maintained and glycoprotein product is produced and harvested" (cf. column 4, lines 6 to 20). Thus, document (1) discloses a shift of culture conditions between these phases. In Example 1, the temperature of the cell culture is lowered (arresting the cell cycle and reducing thereby the metabolic rates) and, simultaneously, sodium butyrate (inhibitor of histone deacetylases and promoting thereby histone hyperacetylation and higher/enhanced DNA transcription) is added (cf. column 11, lines 15 to 66; column 20, lines 3 to 29).

5. Contrary to the opposition division (cf. page 18, last sentence in point 64 of the decision under appeal), the board considers that document (1) refers to the cell culture method as useful for large-scale production of the TNFR-Ig fusion protein, explicitly mentioning several bioreactors and operation systems (batch, fed-batch) (cf. column 10, line 42 to column 11, line 6). The expectations of the opposition division, based on the small-scale examples shown in the patent, as regards the possible scaling-up of every culture medium falling within the cell culture medium defined in claim 1 (cf. page 19, point 71 of the decision under appeal), must also apply to the small-scale examples and cell culture media disclosed in document (1) (cf. *inter alia*, T 2244/09 of 11 June 2013, point 8.3 of the Reasons; T 2184/10 of 20 May 2014, point 14.3 of the

Reasons; see page 14, points 32.1 and 32.2 of the board's communication).

6. Likewise, the board considers that document (1) anticipates the feature of claim 1 concerning the range of "viable cell density" that defines when a shift from "a first set" to "a second set of culture conditions" has to be carried out. The board is convinced that this range is so broadly defined in claim 1 ("about 20%-80% of the maximal possible viable cell density") that it allows for a large variation in the duration of the growth phase before carrying out the shift in the culture conditions and that it certainly includes the normal, routine practice in the field, such as the 2 days exemplified in document (1) (cf. column 20, lines 22 and 23). In this context, the board refers to the established case law concerning the use of unusual parameters for defining the claimed subject-matter (cf. "Case Law", *supra*, I.C.5.2.3, 119; see also page 16, point 32.4 of the board's communication).

7. In the light of the above analysis, the board considers the technical difference between the method disclosed in document (1) and the method of claim 1 to lie in the cell culture medium, in particular in a cell culture medium containing one or more of the medium characteristics selected from the group consisting of the medium characteristics (i) to (v) cited in claim 1.

The objective technical problem

8. Whilst the opposition division and the respondent defined the objective technical problem as the provision of "an improved process of producing a TNFR-Ig polypeptide" (cf. second paragraph on page 18 of the decision under appeal), the appellant defined it

as the provision of an alternative process of producing a TNFR-Ig polypeptide and submitted that if the technical problem was indeed the provision of an improved process, this problem was not solved over the whole breadth of the claim.

9. It is established case law that, if the objective technical problem is not solved over the whole breadth of the claim, this problem has to be reformulated in less ambitious terms (cf. "Case Law", *supra*, I.D.4.4, 177). It is thus necessary for the board to assess the breadth of claim 1. In doing so, the established case law on the interpretation of the claims, in particular when the claimed subject-matter is broadly defined, is relevant. According thereto, there is no reason to use the description of the patent to interpret a broad claim more narrowly, if it is a question not of understanding concepts that require explanation but rather of examining an excessively broad request in relation to the state of the art (cf. "Case Law", *supra*, I.C.4.8, 110; and II.A.3.3, 274).

10. Claim 1 requires the cell culture medium to contain glutamine and one or more of the medium characteristics (i) to (v), wherein only characteristics (ii), (iii) and (v) relate to glutamine. However, none of these characteristics define a specific amount of glutamine but only a ratio of glutamine with other compounds of the cell culture medium, such as asparagine and total amino acids. Moreover, all values and ratios of these medium characteristics - as well as the range of viable cell density cited in claim 1 - are defined by using the term "about", which allows for a considerable variation of these values and ratios. Indeed, according to the definition given in the description, the term "about" refers to a range of values that may "fall

within 25 ... percent or less of the stated reference value for that culture or conditions" (cf. paragraph [0087] of the patent). It is well-known in this technical field that metabolic waste products produced and accumulated during cell culture have detrimental inhibitory or even toxic effects on cell growth, viability and production of the desired protein (cf. paragraph [0003] of the patent referring to the "Background of the invention"). In particular, the role of glucose and glutamine in the production of the by-products lactic acid and ammonium has been amply described in the art (cf. column 14, lines 13 to 16 of document (1); paragraphs [0004] to [0006], [0133] and [0137] of document (3)).

11. Claim 1 not only does not require any particular (absolute) amount of glutamine in the cell culture medium but it does not refer to any concentration or amount of sucrose. Therefore, concentrations of these two products that may result in a (high) production of detrimental waste products are not excluded from the scope of claim 1. It is worth noting that claim 1 does not require any particular yield for the production of TNFR-Ig. Neither reference values or culture conditions are given in this claim, nor an explicit requirement for an increased TNFR-Ig production. The board is thus convinced that claim 1 comprises possible embodiments that do not present or have any of the technical effects referred to by the respondent and cited in the patent. These embodiments are certainly not excluded from the scope of protection of claim 1. Therefore, the board considers that the technical effect referred to by the respondent is not attained over the whole breadth of the claim and, in line with the case law cited above, the objective technical problem has to be reformulated in less ambitious terms, namely as the

provision of an alternative method of producing a TNFR-Ig fusion protein.

12. The objective technical problem formulated in less ambitious terms is solved by the claimed subject-matter and, indeed, throughout the whole breadth of the claim.

Obviousness

13. As summarised above, document (1) refers to the control of cell culture parameters/factors which affect cell specific productivity (cf. column 8, under the heading "Cell Culture procedures", in particular the paragraph bridging columns 8 and 9) and, in this context, it mentions several suitable mammalian cell culture media (cf. paragraph bridging columns 9 and 10). A suitable cell medium for the exemplified CHO host cells is given in column 10, first full paragraph, wherein reference is made to "the formulation of medium as described in" document (2). In Example 1 of document (1), CHO cells are used and the growth medium "DMEM/HAM F-12 based formulation" of document (2) is explicitly cited again as a possible example of cell culture medium (cf. paragraph bridging columns 19 and 20). In the board's view, these references of document (1) would have drawn a skilled person's attention to document (2) and, more particularly, to the specific cell culture media described therein.

14. Document (2) discloses a method of production of recombinant proteins in general which is based on the culture of the mammalian host cells in the media disclosed therein. As in document (1), CHO cells are preferred, and the ingredients and concentrations of the preferred ("Super") medium are listed in Table 4 of document (2) (cf. column 6, line 43 to column 7,

line 30). Cultures of CHO cells are described in Examples 1 and 2; these examples refer to Table A as providing again the composition of the preferred "Super" medium (cf. column 12, lines 1 and 2; column 13, lines 37 to 39; claim 3 of document (2)). According thereto, the "Super" medium contains glutamine and there is evidence on file showing that this medium has the characteristics of features (i), (iii) and (v) of claim 1 when account is taken of the variation allowed by the term "about" (*supra*) (cf. Table on page 11 of appellant's statement of grounds of appeal).

15. In the light thereof, the board is convinced that a skilled person reading the disclosure of document (1) and its attention being drawn to the contents of document (2), would certainly have been highly motivated to use the "Super" medium - described in document (2) as the preferred medium for CHO cells - for producing the TNFR-Ig fusion protein in CHO host cells as described in document (1). Thereby, the skilled person would have arrived at the subject-matter of claim 1 in an obvious manner.

16. As stated in documents (1) and (2) and noted by the board above, CHO cells are extensively used for the production of recombinant proteins, being indeed the mammalian host of choice, the workhorse, for the production of recombinant pharmaceutical/therapeutic proteins.

17. Document (3) discloses a method of improving the production of recombinant polypeptides in mammalian cell cultures, wherein the CHO cells are the preferred host cells (cf. paragraphs [0027], [0043], [0102], [0144]). The method is stated to "improve the viability

of the cell culture, produce higher yields of desired products, reduce by-product accumulation and/or achieve cost savings through more efficient and productive systems, particularly for large scale production" (cf. paragraphs [0001] and [0008]; paragraphs [0098] and [0099] for interactions between cell culture factors/ parameters, and paragraph [0103] for limitations of these factors/parameters in a large-scale manufacturing setting). Document (3) contemplates a "production phase [that] may be continuous with the growth phase" (cf. paragraph [0112]), wherein the initial growth phase "usually [lasts] 1 to 4 days" (cf. paragraph [0106]). The advantageous effect of a temperature shift is identified in this document (cf. paragraphs [0023] and [0024], [0137] and [0138]) as well as the role of glutamine in the production of waste by-products (ammonium and lactic acid) (cf. paragraphs [0125], [0133], [0158], [0161] to [0163], [0168] to [0171]). The culture medium is further defined as comprising excess amounts of amino acids such as asparagine (cf. paragraph [0107]). In the Examples of document (3) and under the heading "Materials and Methods", reference is made to two basic media formulations (Medium A and Medium B) and the ingredients and concentrations of these media are listed in Table 1 of this document. Both media contain glutamine and there is evidence on file showing that these media have most, if not all (account taken of the variation allowed by the term "about"), of the characteristics of the culture medium specified in claim 1 (cf. Tables on page 13 of appellant's statement of grounds of appeal and on page 6 of appellant's reply to the board's communication, respectively).

18. Regardless of the fact that documents (1) and (3) are from the same assignee and share one inventor, the

board considers that, in view of the close relatedness of their disclosures and purposes, a skilled person would have been aware of both documents without hindsight knowledge of the patent and that, starting from document (1), no inventive skill would have been required for using any of the cell culture media disclosed in document (3) in a method of production of TNFR-Ig as described in document (1). Thereby, the skilled person would have arrived at the subject-matter of claim 1 in an obvious manner.

19. Respondent's arguments on the particular strategy followed by document (3) and the references in this document to several features of the disclosed method which are different from those of the method disclosed in the patent, such as the presence of a high glucose concentration and the inclusion of glutamate in the cell culture media, cannot have any bearing on the board's conclusion, because none of these features is mentioned in the method of claim 1 and they are neither required nor excluded from the scope of this claim.

20. It follows from the above considerations that the combination of document (1) with either document (2) or document (3) renders the subject-matter of claim 1 obvious. Therefore, the main request does not fulfil the requirements of Article 56 EPC.

Auxiliary request 1

Admission into the appeal proceedings

21. Auxiliary request 1 is identical to auxiliary request 22 filed by the respondent in reply to the board's communication pursuant to Article 15(1) RPBA (cf. points VII and VIII *supra*). At oral proceedings before the board and, after a decision was taken by the

board on the main request, the respondent made the former auxiliary request 22 its new auxiliary request 1. Thus, auxiliary request 1 was not filed in reply to the statement of grounds of appeal and represents an amendment of the respondent's case in the sense of Article 13(1) RPBA. Therefore, it lies within the board's discretion to admit it or not into the appeal proceedings.

22. In the communication pursuant to Article 15(1) RPBA, the parties were informed of the board's provisional opinion on the main request and, with reference to auxiliary requests 1 to 20, filed in opposition proceedings and filed again in reply to the statement of grounds of appeal, the board stated that "[t]here seems to be no request on file with independent claims comprising all features that, according to the patent, appear to contribute to achieving the desired technical effect(s), such as low concentration of (initial/total cumulative) glutamine (AR1 to AR6), the five medium features (i) - (v) (AR10, AR15 and AR16), an effective range of combined cumulative Gln/Asn (AR11 and AR17), etc., let alone with the particular exemplified CHO cell line" (cf. point 46 of the board's communication). In the board's view, the filing of auxiliary request 22, which is now auxiliary request 1, is a direct reply to the board's communication and, more particularly, to this comment made by the board.

23. The scope of auxiliary request 1 is narrower than that of the main request. Claim 1 defines the mammalian cells as CHO cells and requires the presence of all medium characteristics (i) to (v), wherein the upper open-ended range of characteristic (v) in the main request ("greater than about 16 mM") is replaced by a closed range ("between 16 mM and 36 mM") in auxiliary

request 1. Claim 1 of this auxiliary request defines also the changing of the culture conditions between the first and second set of culture conditions as consisting of a temperature shift, one of the four possible changes listed in dependent claim 3 of the main request. The initial concentration of glutamine ("less than or equal to 4 mM") and the manner in which this amino acid is provided in the medium ("only provided in the initial medium at the beginning of the cell culture"), the subject-matter of dependent claims 5 and 8 of the main request, have also been introduced into claim 1 of auxiliary request 1. Moreover, by deleting all dependent claims except one, the number of claims in auxiliary request 1 is reduced to only three from the fifty claims present in the main request, avoiding thereby possible objections under Article 123(2) EPC that could arise from a combination of dependent claims with the new combination of features present in claims 1 and 2 of auxiliary request 1. It is worth noting that the term "about", used in the main request for qualifying concentration values and ranges, has been deleted in auxiliary request 1 (cf. points II and X *supra*).

24. The renumbering of auxiliary request 22 as auxiliary request 1, made by the respondent after the board's decision on the main request, is considered to be a direct response to this decision and a straightforward attempt of the respondent to overcome the objections raised under Article 56 EPC against the main request. Considering the amendments introduced into this auxiliary request (*supra*), the board concludes that it does not increase the complexity of the case and helps procedural efficiency.

25. Therefore, the board, in the exercise of its discretion, decides to admit auxiliary request 1 into the appeal proceedings (Article 13(1) RPBA).

Article 123(2) EPC

26. Claim 1 of auxiliary request 1 requires the cell culture medium to have all medium characteristics (i) to (v), wherein characteristic (v) is defined as "a combined cumulative amount of glutamine and asparagine per unit volume of between 16 mM and 36 mM". Moreover, claim 1 requires an "initial glutamine concentration" of "less than or equal to 4 mM", wherein "glutamine is only provided in the initial medium at the beginning of the cell culture" (cf. point X *supra*).

27. Claim 82 of the patent application depends on the method of claim 1 of the patent application and requires the cell culture medium to contain all five medium characteristics (i) to (v). However, medium characteristic (v) of said claim 1 is defined by an open-ended range ("greater than about 16 mM") but not by the closed range introduced into claim 1 of auxiliary request 1. Moreover, there are no references in any of these two claims of the patent application to the initial concentration of glutamine and the manner in which glutamine is provided to the cell culture medium.

28. Under the heading "Media", paragraphs [00149] to [00158] of the patent application are concerned with the cell culture media used for producing the TNFR-Ig fusion protein. After referring to the disadvantages and drawbacks of the "traditional media formulations" in paragraph [00149], the "media formulations of the present invention" - with "beneficial effects on cell

growth and/or viability or on expression of polypeptide or protein" - are defined in paragraph [00150] as including "one or more of" the medium characteristics (i) to (v), wherein the medium characteristic (v) is defined by the open-ended range mentioned in claims 1 and 82 of the patent application. It is in paragraph [00150] that the term "cumulative" is defined; a term that qualifies all concentration values and ratios given for each of the medium characteristics (i) to (v).

29. Paragraphs [00151] to [00155] of the patent application are concerned with the medium characteristics (i) to (iv) and it is only in paragraph [00156] that the medium characteristic (v) is addressed. In this paragraph, reference is made to "another preferred embodiment" wherein "the culture medium contains a combined glutamine and asparagine concentration of between about 16 and 36 mM". However, there is no reference therein to the initial concentration of glutamine nor to the manner in which glutamine is added to the medium. There is a reference to Example 14 and to Table 22 as showing the higher titers of expressed polypeptide obtained by "media which contain a combined total concentration of glutamine and asparagine within this range" compared to those obtained by "media which contain a combined total glutamine and asparagine outside this range". The "combined total concentration" may well be equated to the "combined cumulative amount" mentioned in claim 1 of auxiliary request 1, but again there is no information in this sentence on the initial concentration of glutamine and the manner in which glutamine is added to the medium.

30. Example 14 discloses a "Statistical analysis of optimum total glutamine and asparagine levels in Medium 9 for

anti-GDF-8 cell culture in Bioreactors" and, as a conclusion of this analysis, it is stated that "[c]ultures grown in Medium 9 containing between 2 and 15 mM glutamine and between 16 and 36 mM combined glutamine and asparagine exhibited higher anti-GDF-8 titers than cultures grown in media with glutamine and combined glutamine and asparagine levels that fell outside these ranges". There is no indication whether the concentration range of glutamine is a combined cumulative/total concentration or only the initial concentration. In any case, the optimum (closed) range of glutamine concentration ("between 2 and 15 mM") disclosed therein is different from the (open-ended) range cited in claim 1 of auxiliary request 1 ("less than or equal to 4 mM").

31. The results obtained in Example 14 are shown in Table 23 of the patent application and the composition of Medium 9, used in this example, is shown in Table 14 (4 mM glutamine). The concentrations of glutamine, asparagine and the total concentrations of these two amino acids are indicated in four different columns of Table 23 and, in another column, information is given on the "Day Shifted Feed" (media with/without glutamine and asparagine). Although, for some of the experimental conditions given in Table 23, the initial glutamine concentration in Medium 9 and the provision (at the beginning) to this Medium may fall within those defined in claim 1 of auxiliary request 1, there is nothing in Table 23 nor in Example 14 that may draw the reader's attention to these particular conditions among all the other conditions disclosed in this Table. In the board's view, the open-ended range of initial glutamine concentration as defined in claim 1 of auxiliary request 1 is not directly and unambiguously derivable from Table 23 or Example 14, let alone its combination

with the manner in which this amino acid is added to Medium 9 and with the (cumulative, closed) range defined by characteristic (v) in claim 1 of auxiliary request 1.

32. Claim 11 of the patent application discloses the open-ended range of initial glutamine concentration ("less than or equal to 4 mM") cited in claim 1 of auxiliary request 1, and claim 16 of the patent application discloses the manner ("at the beginning of the cell culture") in which glutamine is provided to the culture medium as required by claim 1 of auxiliary request 1. However, claim 16 is not dependent on claim 11 and these two claims depend on claim 1 of the patent application which, as stated above, defines medium characteristic (v) by an open-ended range ("greater than about 16 mM") and not by a closed range ("between 16 mM and 36 mM") as recited in claim 1 of auxiliary request 1.

33. It follows from the above considerations that the subject-matter of claim 1 of auxiliary request 1 is not directly and unambiguously derivable from the content of the patent application, and thus, auxiliary request 1 contravenes Article 123(2) EPC.

Auxiliary request 2
Admission into the appeal proceedings

34. Auxiliary request 2 is identical to auxiliary request 15 originally filed on 7 May 2014 in preparation of the oral proceedings at first instance and filed again in appeal proceedings in reply to the statement of grounds of appeal. At the oral proceedings before the board and, once a decision had been taken on the main request and on auxiliary request 1, the

respondent made auxiliary request 15 its new auxiliary request 2 (cf. points IV and IX *supra*).

35. Since the opposition division decided to reject the opposition, none of the auxiliary requests filed on 7 May 2014, including auxiliary request 15, were ever examined in opposition proceedings. Indeed, as a result of said rejection, there was neither a need for the opposition division to consider the admission of these auxiliary requests into the proceedings nor to examine the requirements of patentability for any of them. There is thus no reference to any of these issues in the decision under appeal. In the board's view, this situation does not imply in any manner that all these auxiliary requests filed at first instance, including auxiliary request 15, formed already part of the opposition proceedings, let alone part of the present appeal proceedings. On the contrary, if the opposition division had come to a decision different from that taken in the decision under appeal, it would then - and only then - have had to assess and decide on the admission of these auxiliary requests, including auxiliary request 15, into the opposition proceedings; reasons would then have had to be given for their admission or non-admission into the proceedings. It cannot be excluded that some of these auxiliary requests, including auxiliary request 15, would not have been admitted into the proceedings for several reasons, such as late-filing, *prima facie* patentability issues, etc.

36. The filing by the respondent of all these auxiliary requests in reply to the statement of grounds of appeal, makes them part of the basis of the appeal proceedings in the sense of Articles 12(1) and 12(2) RPBA. However, for the reasons given above and as

stated in point (45) of the board's communication pursuant to Article 15(1) RPBA, "the fact that these auxiliary requests were filed at an earlier stage of the proceedings does not necessarily mean that they are already part of the appeal proceedings, or that they must be admitted by the board into the appeal proceedings without further examination". Moreover, in the present case, the selection and renumbering of auxiliary request 15 as auxiliary request 2 by the respondent at the oral proceedings before the board, represents an amendment of its case and thus, it lies within the board's discretion to admit such amendment (Article 13(1) RPBA).

37. In order to exercise its discretion, the board considers it appropriate to examine not only procedural issues raised by the submission of auxiliary request 2 at this stage of the appeal proceedings, but also the subject-matter of this auxiliary request.

38. As regards the subject-matter of auxiliary request 2, the following points are important:

38.1 Dependent claims present in the main request but not in auxiliary request 1 have been reintroduced in auxiliary request 2. Whilst auxiliary request 1 has a total of three claims, auxiliary request 2 has forty seven claims, only three less than the main request.

38.2 Whilst the host cells in claim 1 of auxiliary request 1 are CHO cells, claim 1 of auxiliary request 2 refers to mammalian cells in general as in claim 1 of the main request. Likewise, as in claim 1 of the main request, claim 1 of auxiliary request 2 contains the term "about" for qualifying all values and ratios of the medium characteristics (i) to (v) and the range of

viable cell density; this term is absent in claim 1 of auxiliary request 1.

38.3 Although in the method of claim 1 of auxiliary request 2 all five medium parameters (i) to (v) are required as in claim 1 of auxiliary request 1, medium parameter (v) is not defined by the closed range introduced into claim 1 of auxiliary request 1 ("between 16 mM and 36 mM") but by an open-ended range as in claim 1 of the main request ("greater than about 16 mM"). Moreover, as in claim 1 of the main request and contrary to claim 1 of auxiliary request 1, there is no limitation to a temperature shift between the first and second sets of culture conditions but only a reference to "changing at least one of the culture conditions" in general.

38.4 Likewise and contrary to claim 1 of auxiliary request 1, claim 1 of auxiliary request 2, as claim 1 of the main request, neither defines an initial glutamine concentration nor the manner in which glutamine is provided to the cell culture.

38.5 In addition, three new functional features have been introduced into claim 1 of auxiliary request 2, none of them present in claim 1 of the main request and of auxiliary request 1. The first and second features refer to the lactate and ammonium levels, respectively, and the third to the total amount of TNFR-Ig produced (cf. point XI *supra*). These three functional features are identical to those defined in claim 49 of the main request; claim 49 being dependent only on claims 1-2 and 46-48 of the main request.

38.6 It derives from all these considerations that the subject-matter of auxiliary request 2 is not directly

derivable from that of auxiliary request 1 but comprises (broader) features taken from the main request. Hence, the envisaged scope of protection of auxiliary request 2 is somewhere between that of the main request and auxiliary request 1. There is thus no convergence from auxiliary request 1 to auxiliary request 2 but divergence.

38.7 Moreover, the presence of new (functional) features in the independent claims of auxiliary request 2 and the reintroduction of dependent claims in this request results in combinations of subject-matter which, as such, are not directly present in either the main request or in auxiliary request 1. As a consequence thereof, new issues may arise that increase the complexity of the case. Indeed, auxiliary request 2 renders the matter of the appeal much more complex and it certainly does not contribute to the efficiency of the procedure. It is worth noting here that the appellant has raised objections under Articles 123(2), 83, 54 and 56 EPC against this auxiliary request, even though in a very general manner.

39. As regards procedural issues raised by the submission of auxiliary request 2 at the oral proceedings in appeal, the following points are important:

39.1 In the board's view, the selection and re-filing of this particular auxiliary request at the oral proceedings before the board makes it a late-filed request. Although it was already present, as auxiliary request 15, among auxiliary requests 1 to 22 filed in reply to the statement of grounds of appeal, it was only selected once a decision had been taken on the main request and auxiliary request 1, and not at earlier stages of the appeal proceedings, such as in

reply to the board's communication pursuant to Article 15(1) RPBA. There was nothing in respondent's reply to this communication that could have drawn the appellant's and the board's attention to this particular request, indicating thereby its relevance in the current proceedings. On the contrary, in reply to the board's communication, the respondent withdrew its former auxiliary request 21, renumbered its former auxiliary request 22 as auxiliary request 23, and filed new auxiliary requests 21 and 22 (the latter now being auxiliary request 1 in appeal). It did not, however, alter the hierarchy or sequence of the other auxiliary requests then on file, including auxiliary request 15 (cf. point VIII *supra*).

39.2 The above described course of events during the appeal proceedings and at the oral proceedings before the board, does not contribute to procedural efficiency. The board considers that the principle of convergence applies not only to the set of claims filed during the proceedings, i.e. the hierarchy of the claim requests, but also to the actual development or course of events that take place during the opposition and the appeal proceedings. Although the filing of a large number of auxiliary requests at first instance may in some cases be justified, the mere fact of filing cannot serve as a justification for automatically admitting all these auxiliary requests into the appeal proceedings, especially when their admission has not even been examined at first instance. In the board's view, the use of such a large number of auxiliary requests as a pool or group of auxiliary requests from which to select one or several in a stepwise manner in appeal proceedings, disregarding their hierarchy, and only after a decision has been taken on other requests, is not in line with the principle of convergence. Such a

course of events certainly gives the patent proprietor an unwarranted advantage.

40. In view of the considerations made by the board in points 38 and 39 above, and in line with the established case law on the filing of claim requests in appeal proceedings (cf. "Case Law", *supra*, IV.E.4, 1127), in particular on the filing of requests at the oral proceedings (cf. "Case Law", *supra*, IV.E.4.2.6, 1134), and on the criteria for consideration of amended claim requests (cf. "Case Law", *supra*, IV.E.4.4, 1151), in particular on converging and diverging versions of claims (cf. "Case Law", *supra*, IV.E.4.4.4, 1154), as well as on procedural economy in appeal proceedings (cf. "Case Law", *supra*, IV.E.4.2.2, 1130), the board, in the exercise of its discretion, decides not to admit auxiliary request 2 into the appeal proceedings (Article 13(1) RPBA).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

B. ter Heijden B. Stolz

Decision electronically authenticated